

Differences in Biofilm Development among *Streptococcus pneumoniae* Isolates from Children Who Live in Day Care Centers in Tehran, Iran

Seyyed Fazlollah Mousavi*; Bahareh Shaghaghi; Tahereh Setayesh; Maryam Aghaabbasi; Pantea Jalali;

Microbiology Research Center ; Bacteriology Department , Pasteur Institute , Tehran, Iran

sar.setayesh@yahoo.com

Background & Objectives: In recent years, biofilm formed by *S. pneumoniae* has begun to attract attention for a possible role in strains virulence. It appears that biofilm formation is a rather common feature among pneumococci, an observation which would fit with some types of infections caused by this microorganism, which have often been associated with the ability to form biofilm.

Methods: We evaluated the ability to form biofilm 75 *S. pneumoniae* isolates from nasopharynx swabs of children who live in day care centers in Tehran, Iran. Bacterial suspensions in Todd Hewitt broth+1% glucose were prepared at OD₆₀₀=0.5 and used to inoculate 96-well micro plates. Plates were incubated for 18h in 5% CO₂ atmosphere. Supernatant was then discarded, and plates were washed with saline solution, air dried, and stained with crystal violet. The optical density of the biofilm was measured at 570nm with a spectrophotometer.

Results: A baseline calculated on three standard deviations 0.023 above the mean OD=0.050 of a clean tissue culture plate stained by the OD=0.120 as the threshold below which strains would be considered as non-formers. In this way, only five strains out of 75 were non-biofilm formers. Five isolates could be classified as weak-biofilm formers (0.120<OD<0.240), while the other strains tested were strong biofilm producers (66 isolates).

Conclusion: A large variability in the amount of biofilm produced was observed among the strains examined; in any case this appeared to be a very common feature among *S. pneumoniae*. Such observation correlates well with the types of infections caused by this microorganism, which have been often associated with the ability to form biofilm. This lack of association between the ability to form biofilm and any of the characters examined, while being a very common feature of pneumococci, may be suggestive of an important role for biofilm in pneumococcal ecology which will need further studies to elucidate.

Keywords: Biofilm; *Streptococcus pneumoniae*; Children